<u>WE CLAIM</u>:

1.   A method for designing an integrated circuit, the method comprising the steps of:

defining a preliminary design of the integrated circuit;

5   identifying critical interconnect lines in the preliminary design;

identifying any critical interconnect lines affected by crossing lines in the preliminary design;

defining a transmission line model to represent each critical interconnect line;

defining a layout design of the integrated circuit, comprising circuit components and

10 parameters thereof, using said preliminary design and said transmission line model for each critical interconnect line; and

extracting component parameters from the layout design for simulation of the design using the extracted component parameters;

wherein for each transmission line model representing a critical interconnect line affected

15 by a crossing line, the method includes providing an environment terminal, comprising a connection to the model via at least one circuit component representing the effect of the crossing line on the model, and connecting the environment terminal to the crossing line in the integrated circuit design.

20 2.   A method according to claim 1 wherein the preliminary design comprises a high level design of the integrated circuit.

3.   A method according to claim 1 wherein said at least one circuit component representing the effect of the crossing line comprises a capacitor.

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4.   A method according to claim 1 wherein, for at least a subset of critical interconnect lines affected by crossing lines, the step of defining a transmission line model to represent each critical interconnect line in the subset includes providing said environment terminal for that transmission line model.

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5.   A method according to claim 1 wherein, for at least a subset of critical interconnect lines affected by crossing lines, the step of defining a layout design includes providing said environment terminal for the transmission line model representing each critical interconnect line in the subset.

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6.   A method according to claim 1 wherein, for at least a subset of critical interconnect lines affected by crossing lines, the step of extracting component parameters includes providing said environment terminal for the transmission line model representing each critical interconnect line in the subset.

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7.   A method according to claim 2 wherein the step of defining a layout design comprises:
       defining a schematic design of the integrated circuit, comprising a preliminary set of circuit components and parameters thereof, using said high level design and said transmission line model for each critical interconnect line; and

15   defining the layout design, comprising a secondary set of circuit components and parameters thereof and indicating component locations, using said schematic design.

8.   A method according to claim 1 wherein the transmission line model defined for each critical interconnect line comprises an RLC network.

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9.   A method according to claim 1 wherein the step of defining a transmission line model comprises:
       defining a transmission line structure;
       defining geometrical parameters for the transmission line structure; and

25   defining the transmission line model in dependence on said structure and geometrical parameters.

10.   A method according to claim 9 wherein the step of defining a transmission line structure comprises selecting the structure from a predefined set of transmission line structures.

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11.   A method according to claim 1 including the step of simulating the design using said extracted component parameters.

12.   An integrated circuit design system comprising:

5   means for defining a preliminary design of an integrated circuit;

means for defining transmission line models to represent respective critical interconnect lines in the preliminary design;

means for defining a layout design of the integrated circuit, comprising circuit components and parameters thereof, based on said preliminary design and said transmission line

10 model for each critical interconnect line;

post-layout extraction means for extracting component parameters from the layout design for simulation of the design using the extracted component parameters; and

means for including in the integrated circuit design, for each transmission line model representing a critical interconnect line affected by a crossing line in the design, an environment

15 terminal connected to said crossing line, the environment terminal comprising a connection to said model via at least one circuit component representing the effect of said crossing line on the model.

13.   A system according to claim 12 wherein the preliminary design comprises a high level

20 design of the integrated circuit.

14.   A system according to claim 12 wherein said at least one circuit component representing the effect of the crossing line comprises a capacitor.

25 15.   A system according to claim 12 wherein said means for defining transmission line models is adapted for providing a said environment terminal for a transmission line model representing a critical interconnect line affected by a crossing line in the preliminary design.

16.   A system according to claim 12 wherein said means for including an environment

30 terminal in the design comprises said post-layout extraction means.

17.   A system according to claim 12 wherein each transmission line comprises an RLC network.

5   18.   A system according to claim 12 wherein said means for defining a transmission line model includes means for defining a transmission line structure and geometrical parameters thereof, and for defining the transmission line model in dependence on said structure and geometrical parameters.

10   19.   A system according to claim 18 wherein said means for defining a transmission line structure comprises means for selecting the structure from a predefined set of transmission line structures.

20.   A system according to claim 12 including means for simulating the design using said
15   extracted component parameters.

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21.   A computer program product comprising a computer-readable medium having embodied therein computer-readable program code means for causing a computer to implement an integrated circuit design system comprising:
20   means for defining a preliminary design of an integrated circuit;
            means for defining transmission line models to represent respective critical interconnect lines in the preliminary design;
            means for defining a layout design of the integrated circuit, comprising circuit components and parameters thereof, based on said preliminary design and said transmission line
25   model for each critical interconnect line;
            post-layout extraction means for extracting component parameters from the layout design for simulation of the design using the extracted component parameters; and
            means for including in the integrated circuit design, for each transmission line model representing a critical interconnect line affected by a crossing line in the design, an environment
30   terminal connected to said crossing line, the environment terminal comprising a connection to

said model via at least one circuit component representing the effect of said crossing line on the model.

22. A computer program product comprising a computer-readable medium having embodied
5 therein computer-readable program code means for causing a computer to implement an interconnect modeling component of an integrated circuit design system, the interconnect modeling component being adapted for:

defining transmission line models to represent respective critical interconnect lines in an integrated circuit design; and

10 providing, for a said transmission line model representing a critical interconnect line affected by a crossing line in the integrated circuit design, an environment terminal comprising a connection to the model via at least one circuit component representing the effect of said crossing line on the model.

15 23. An integrated circuit design kit including a product according to claim 22.

24. A computer program product comprising a computer-readable medium having embodied therein computer-readable program code means for causing a computer to implement a post-layout extraction component of an integrated circuit design system in which critical
20 interconnect lines in an integrated circuit design are represented by respective transmission line models, the post-layout extraction component being adapted for processing a layout design of the integrated circuit, which layout design comprises circuit components, including said transmission line models, and parameters thereof, by:

including in the layout design, for a transmission line model representing a critical
25 interconnect line affected by a crossing line in the design, an environment terminal connected to said crossing line, the environment terminal comprising a connection to said model via at least one circuit component representing the effect of said crossing line on the model; and

extracting component parameters from the layout design for simulation of the design using the extracted component parameters.